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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/746,153	12/22/2000	Kwang Soon Kim	300055.479	2337

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EXAMINER

WARE, CICELY Q

ART UNIT	PAPER NUMBER
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2634

DATE MAILED: 03/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/746,153

Applicant(s)

KIM ET AL.

Examiner

Cicely Ware

Art Unit

2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-15, 17 and 18 is/are rejected.
- 7) ☒ Claim(s) 7, 16 and 19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>1</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The abstract of the disclosure is objected to because

a. Pg. 17, line 7, applicant uses the phrase "signals are almost same".

Examiner suggests applicant use "signals are almost the same" for clarification purposes.

b. Examiner suggests applicant delete line 12.

Correction is required. See MPEP § 608.01(b).

2. The disclosure is objected to because of the following informalities:

a. Pg. 1, lines 9-11, examiner suggests applicant re-write these lines for clarification purposes.

b. Pg. 2, line 25, applicant uses the phrase "plurality of antenna". Examiner suggests applicant use "plurality of antennas" for clarification purposes. Applicant makes reference to this phrase throughout the disclosure. Examiner suggests applicant correct all instances.

c. Pg. 4, line 17, applicant uses the phrase "antennas are same". Examiner suggests applicant use "antennas are the same" for clarification purposes.

d. Pg. 4, line 18, applicant uses the phrase "is not so greater compared". Examiner suggests applicant use "are not greater, compared" for clarification purposes.

e. Pg. 4, line 19, applicant uses the phrase "antennas are very smaller". Examiner suggests applicant use "antennas are smaller" for clarification purposes.

f. Pg. 5, line 3-4 and Pg. 6, line 1, line 28, applicant uses the phrase "structure will be now explained". Examiner suggests applicant use "structure will now be explained" for clarification purposes.

g. Pg. 5, line 10, applicant makes reference to "fingers 140". Examiner assumes applicant means "fingers 240".

h. Pg. 5, line 12-13, examiner suggests applicant re-write these lines for clarification purposes.

i. Pg. 6, line 2, applicant uses the phrase "signals having the almost same". Examiner suggests applicant use "signals having almost the same" for clarification purposes.

j. Pg. 6, line 14, applicant uses the phrase "the signals and then send". Examiner suggests applicant use "the signals and then sends" for clarification purposes.

k. Pg. 6, line 19, line 24, applicant uses the phrase "apparatus 420 consisted of". Examiner suggests applicant use "apparatus 420 consisting of" for clarification purposes.

l. Pg. 7, line 1, applicant uses "antenna1". Examiner suggests applicant use "antenna" for clarification purposes.

m. Pg. 7, line 6, applicant uses the phrase "by which a N_1 number". Examiner suggests applicant use "by which an N_1 number for clarification purposes.

n. Pg. 9, line 8, applicant uses the phrase "transmitting signal estimator the performs". Examiner suggests applicant use "transmitting signal estimator performs" for clarification purposes.

Appropriate correction is required.

Claim Objections

3. Claims 1, 9, 10 are objected to because of the following informalities:

a. Claim 1, line 3, applicant uses the phrase "plurality of antenna". Examiner suggests applicant use "plurality of antennas" for clarification purposes. Applicant makes reference to this phrase throughout the claims. Examiner suggests applicant correct all instances.

b. Pg. 13, line 7-8, examiner suggests applicant re-write these lines for clarification purposes.

c. Pg. 13, line 14, applicant uses the phrase "signal;fingers". Examiner suggests applicant use "signal; fingers" for clarification purposes.

d. Pg. 13, line 15, applicant uses the phrase "delay information in". Examiner suggests applicant use "delay information in" for clarification purposes.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. Claims 1, 9 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1, 9 and 10 recite the limitation "almost same". This limitation is vague and indefinite because it does not reference an actual and distinct boundary.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

~~(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.~~

6. Claims 1, 3, 4 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lomp et al. (US Patent 6,272,168) in view of Lynch et al. (US Patent 6,275,484).

(1) With regard to claim 1, Lomp et al. discloses in a CDMA modem receiver wherein a finger comprises: a tracking apparatus (Fig. 4, Fig. 6 (607)) for receiving and multiplexed signals to estimate time delay information non said multiplexed signals; a de-spreading apparatus (Fig. 6 (602), Fig. 7 (701)) for de-spreading said multiplexed signals with said estimated time delay information, each of which are received from said antenna signal combiner and said tracking apparatus, respectively; and a demodulated apparatus of demodulating said de-spread signals received from said de-spreading apparatus, to estimate original signals received by said plurality of antennas (Fig. 4, col.

1, lines 39-47, col. 4, lines 32-35). However Lomp et al. does not disclose an antenna signal combiner for combining signals received by a plurality of antenna and having the time delays with an adequate delay to produce multiplexed signals.

However Lynch et al. discloses a CDMA base station wherein an antenna signal combiner for combining signals received by a plurality of antenna has time delays with an adequate delay to produce multiplexed signals (col. 1, lines 51-57, col. 3, lines 36-41).

Therefore it would have been obvious to one of ordinary skill in the art to modify Lomp et al. to incorporate wherein an antenna signal combiner for combining signals received by a plurality of antenna has time delays with an adequate delay to produce multiplexed signals in order to achieve the highest uplink gain which is achieved when all rake fingers are actively capturing energy (Lynch et al. col. 1, lines 58-59).

(2) With regard to claim 3, claim 3 inherits all the limitations of claim 1. Lomp et al. further discloses wherein said tracking apparatus includes a time delay information estimator for estimating each of time delay information on said multiplexed signals received from said antenna signal combiner using a time division method, a demultiplexer for demultiplexing said time delay information, a plurality of storage means for storing each of said demultiplexed signals and a combiner for adequately selecting or combining the result in which the procedure from said demultiplexer to said storage means is repeated during a predetermined time or by a predetermined number of times to estimate time delay information on said demultiplexed signals (Fig. 4, Fig. 7, col. 16, lines 46-67, col. 1, lines 19-20, col. 17, lines 10-67, col. 18, lines 1-9).

(3) With regard to claim 4, claim 4 inherits all the limitations of claim 1. Lomp et al. further discloses wherein said de-spreading apparatus includes a de-spread information extractor for receiving the estimated time delay information from said tracking apparatus and said multiplexed signals from said antenna signal combiner to de-spread each of the signals using a time division method, a demultiplexer for demultiplexing said de-spread signals and a plurality of storage means for storing each of said de-spread signals, wherein the procedure from said de-spread information extractor to said storage means is repeated during a predetermined time or by a predetermined number of times to de-spread said multiplexed signals (Fig. 6 (602, 607), Fig. 7 (701), col. 17, lines 10-67, col. 18, lines 1-9).

(4) With regard to claim 8, claim 8 inherits all the limitations of claim 1. Lomp et al. further discloses wherein said demodulating apparatus demodulates only said de-spread signals from said de-spread apparatus to estimate original signals received by said plurality of antennas (col. 1, lines 39-46, col. 2, line 16, 20).

7. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lomp et al. (US Patent 6,272,168) in combination with Lynch et al. (US Patent 6,275,484) as applied to claim 1 above, and further in view of La Rosa et al. (US Patent 6,078,611) (cited by applicant).

With regard to claim 2, claim 2 inherits all the limitations of claim 1. Lomp et al. in combination with Lynch et al. disclose all the limitations of claim 1 above. However Lomp et al. in combination with Lynch et al. do not disclose the finger further including a

multiplexer for receiving said de-spread signals from said de-spreading apparatus extending the distance between signals of said de-spread signals to produce transformed de-spread signals and transmitting said transformed de-spread signals to said demodulating apparatus.

However La Rosa et al. discloses a rake receiver and finger further including a multiplexer for receiving de-spread signals from the de-spreading apparatus extending the distance the de-spread signals to produce transformed de-spread signals and transmitting transformed de-spread signals to the demodulating apparatus (Fig. 4 (402, 404), Fig. 5 (506), Fig. 6, col. 7, lines 20-31, col. 8, lines 66-67, col. 9, lines 1-67, col. 10, lines 1-18).

~~Therefore it would have been obvious to one of ordinary skill in the art to modify~~
the inventions of Lomp et al. in combination with Lynch et al. to incorporate a finger further including a multiplexer for receiving de-spread signals from the de-spreading apparatus extending the distance the de-spread signals to produce transformed de-spread signals and transmitting transformed de-spread signals to the demodulating apparatus in order to compare the time position of each of the fingers of the rake receiver to prevent collisions and step through the other fingers and sequentially compare the current finger position with each of the other finger's position (La Rosa et al. col. 9, lines 37-39).

8. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lomp et al. (US Patent 6,272,168) in combination with Lynch et al. (US Patent 6,275,484) as applied to claim 1 above, and further in view Levin (US Patent 6,639,906).

With regard to claim 5, claim 5 inherits all the limitations of claim 1. Lomp et al. in combination with Lynch et al. disclose all the limitations of claim 1 above. However Lomp et al. in combination with Lynch et al. do not disclose wherein said demodulating apparatus includes a transmitting signal estimator for performing a demodulating process of each of the signals per the plurality of antennas for said multiplexed signals received from said multiplexer using the time division method, and a combiner for adequately selecting and combining the output signals from said transmitting signal estimator to estimate original signals received by the plurality of antennas.

However Levin discloses a multichannel demodulator comprising a transmitting signal estimator for performing a demodulating process of each of the signals per the plurality of antennas for the multiplexed signals received from the multiplexer using the time division method, and a combiner for adequately selecting and combining the output signals from the transmitting signal estimator to estimate original signals received by the plurality of antennas (Fig. 5, Fig. 6, col. 8, lines 9-67, col. 9, lines 1-61).

Therefore it would have been obvious to one of ordinary skill in the art to modify the inventions of Lomp et al. in combination with Lynch et al. to incorporate a demodulator comprising a transmitting signal estimator for performing a demodulating process of each of the signals per the plurality of antennas for the multiplexed signals received from the multiplexer using the time division method, and a combiner for

adequately selecting and combining the output signals from the transmitting signal estimator to estimate original signals received by the plurality of antennas in order to process a set of fingers received at a particular time offset and process these fingers using a particular channel code. (Levin, abstract).

9. Claims 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lomp et al. (US Patent 6,272,168) in combination with Lynch et al. (US Patent 6,275,484) as applied to claim 1 above, and further in view Miura (US Patent 6,333,934).

(1) With regard to claim 6, claim 6 inherits all the limitations of claim 1. Lomp et al. in combination with Lynch et al. disclose all the limitations of claim 1 above. However ~~Lomp et al. in combination with Lynch et al. do not disclose the finger further including a~~ channel estimating apparatus for estimating channel information of said de-spread signals received from said de-spreading apparatus.

However Miura discloses a CDMA receiving apparatus wherein the finger includes a channel estimating apparatus for estimating channel information of the de-spread signals received from the de-spreading apparatus (Fig. 1a (1, 5, 6)).

Therefore it would have been obvious to one of ordinary skill in the art to modify the inventions of Lomp et al. in combination with Lynch et al. to incorporate a finger including a channel estimating apparatus for estimating channel information of the de-spread signals received from the de-spreading apparatus to accurately effect synchronous follow-up to the reception signal in an environment wherein the reception delay amount varies (Miura col. 3, lines 50-55).

10. Claims 9, 10, 12-14, 17 rejected under 35 U.S.C. 103(a) as being unpatentable over Levin (US Patent 6,639,906) in view of Lomp et al. (US Patent 6,272,168).

(1) With regard to claim 9, Levin discloses a digital receiver in (Fig. 4 (102, 106)) comprising an RF analog to baseband digital converter for converting RF analog signals received by a plurality of antennas; a signal searcher (130) for receiving the output signals from said RF analog to baseband digital converter to generate information of the intensity of the baseband digital signals; a signal controller(134) for receiving information on the intensity of the signals for said signal searcher and the output signals from said RF analog to baseband digital converter to send the M number of the signals among the output signals from said RF analog to baseband digital converter using the information on the intensity of said signal; fingers for receiving the M number of signals from said signal controller to estimate a common time delay information in the received M number of signals and for estimating original signals received per the plurality of antennas using said estimated time delay information and a time division method. However Levin does not disclose a rake receiver comprising a combiner for receiving said estimated original signals from said fingers and for combining said original signals, to thus estimate original signals received by the plurality of antennas.

However Lomp et al. discloses a pilot rake receiver (Fig. 7 (720)) comprising a combiner for receiving said estimated original signals from said fingers (711-719) and for combining said original signals, to thus estimate original signals received by the plurality of antennas (col. 4, lines 32-35, col. 2, lines 16, 20).

Therefore it would have been obvious to one of ordinary skill in the art to modify the invention of Levin to incorporate a rake receiver comprising a combiner for receiving said estimated original signals from said fingers and for combining said original signals, to thus estimate original signals received by the plurality of antennas in order to collect all the multipath pilot signal power (Lomp et al. col. 21, lines 20-21).

(2) With regard to claim 10, claim 10 inherits all the limitations of claims 9 and 1. Lomp et al. further discloses a rake receiver with fingers (col. 2, lines 16, 20, Fig. 7, Fig. 4, col. 4, lines 32-36).

(3) With regard to claim 12, claim 12 inherits all the limitations of claim 10. Lomp et al. further discloses wherein said tracking apparatus includes a time delay information estimator for estimating each of time delay information on said multiplexed signals received from said antenna signal combiner using a time division method, a demultiplexer for demultiplexing said time delay information, a plurality of storage means for storing each of said demultiplexed signals and a combiner for adequately selecting or combining the result in which the procedure from said demultiplexer to said storage means is repeated during a predetermined time or by a predetermined number of times to estimate time delay information on said demultiplexed signals (Fig. 4, Fig. 7, col. 16, lines 46-67, col. 1, lines 19-20, col. 17, lines 10-67, col. 18, lines 1-9).

(4) With regard to claim 13, claim 13 inherits all the limitations of claim 10. Lomp et al. further discloses wherein said de-spreading apparatus includes a de-spread information extractor for receiving the estimated time delay information from said tracking apparatus and said multiplexed signals from said antenna signal combiner to

de-spread each of the signals using a time division method, a demultiplexer for demultiplexing said de-spread signals and a plurality of storage means for storing each of said de-spread signals, wherein the procedure from said de-spread information extractor to said storage means is repeated during a predetermined time or by a predetermined number of times to de-spread said multiplexed signals (Fig. 6 (602, 607), Fig. 7 (701), col. 17, lines 10-67, col. 18, lines 1-9).

(5) With regard to claim 14, claim 14 inherits all the limitations of claim 10. Levin further discloses a multichannel demodulator comprising a transmitting signal estimator for performing a demodulating process of each of the signals per the plurality of antennas for the multiplexed signals received from the multiplexer using the time division method, and a combiner for adequately selecting and combining the output signals from the transmitting signal estimator to estimate original signals received by the plurality of antennas (Fig. 5, Fig. 6, col. 8, lines 9-67, col. 9, lines 1-61).

(6) With regard to claim 17, claim 17 inherits all the limitations of claim 10. Lomp et al. further discloses wherein said demodulating apparatus demodulates only said de-spread signals from said de-spread apparatus to estimate original signals received by said plurality of antennas (col. 1, lines 39-46, col. 2, line 16, 20).

11. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lomp et al. (US Patent 6,272,168) in combination with Lynch et al. (US Patent 6,275,484) as applied to claim 10 above, and further in view Miura (US Patent 6,333,934).

With regard to claim 15, claim 15 inherits all the limitations of claim 10. Miura further discloses a CDMA receiving apparatus wherein the finger includes a channel estimating apparatus for estimating channel information of the de-spread signals received from the de-spreading apparatus (Fig. 1a (1, 5, 6)).

12. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lomp et al. (US Patent 6,272,168) in combination with Lynch et al. (US Patent 6,275,484) as applied to claim 10 above, and further in view of La Rosa et al. (US Patent 6,078,611) (cited by applicant).

With regard to claim 11, claim 11 inherits all the limitations of claim 10. La Rosa et al. further discloses a rake receiver and finger further including a multiplexer for receiving de-spread signals from the de-spreading apparatus extending the distance the de-spread signals to produce transformed de-spread signals and transmitting transformed de-spread signals to the demodulating apparatus (Fig. 4 (402, 404), Fig. 5 (506), Fig. 6, col. 7, lines 20-31, col. 8, lines 66-67, col. 9, lines 1-67, col. 10, lines 1-18).

13. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al. (US Patent 6,668,011) in view of Miura (US Patent 6,333,934).

With regard to claim 18, Li et al. discloses in (Fig. 2) block detection receiver for estimating signals of a finger comprising: a first step combining signals received by a plurality of antenna and having an adequate delay to produce multiplexed signals; a second step of estimating a common time delay information on said multiplexed signals (col. 4, lines 37-67, col. 5, lines 11-17, Fig. 2 (310, 320)). However Li et al. does not disclose a third step of de-spreading said multiplexed signals using said estimated time delay information to produce de-spread signals; a fourth step of estimating channel information of said de-spread signals; and a fifth step of demodulating said de-spread signals on signals of each of antennas basis using said estimated channel information to estimate signals received by said plurality of antennas.

However Miura discloses a CDMA receiver comprising a third step of de-spreading said multiplexed signals using said estimated time delay information to produce de-spread signals; a fourth step of estimating channel information of said de-spread signals; and a fifth step of demodulating said de-spread signals on signals of each of antennas basis using said estimated channel information to estimate signals received by said plurality of antennas (Fig. 9 (5,6), Fig. 10, (111,112, 113, 118, 119, 120)).

Therefore it would have been obvious to one of ordinary skill in the art to modify Li et al. to incorporate a third step of de-spreading said multiplexed signals using said estimated time delay information to produce de-spread signals; a fourth step of

estimating channel information of said de-spread signals; and a fifth step of demodulating said de-spread signals on signals of each of antennas basis using said estimated channel information to estimate signals received by said plurality of antennas to accurately effect synchronous follow-up to a reception signal in an environment wherein the reception delay amount varies.

Allowable Subject Matter

14. Claims 7, 16 and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

15. The prior art made record of and not relied upon is considered pertinent to applicant's disclosure:

a. Buehrer et al. US Patent 6,515,978 discloses downlink diversity in a CDMA system.

b. Sudo et al. US Patent 6625202 disclose a mobile station for spread spectrum communication.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cicely Ware whose telephone number is 703-305-8326. The examiner can normally be reached on Monday – Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Cicely Ware

cqw
March 9, 2004
